Fungi of the future

Assessing the effects of elevated CO_2 on forest fungal communities

1. Why study forest fungi?

The aim of the Birmingham Institute of Forest Research (BIFoR) Free Air Carbon dioxide Experiment (FACE) is to investigate how temperate forests will respond to increasing CO_2. Fungi play critical roles in carbon and nitrogen cycling, and in plant and human health; however, we do not understand how eCO_2 will affect their communities.

2. BIFoR FACE

Located in Norbury Park, Staffordshire, our ancient oak woodland is studded with 25m high metal towers. The towers encircle the trees, creating 25 m diameter "arrays".

There are 9 arrays in total:

- 3 elevated CO_2 (eCO_2) arrays (~555 ppm)
- 3 ambient CO_2 arrays (~405 ppm)
- 3 "ghost" arrays without towers and at ambient CO_2

3. Research questions

How do fungal communities (the ratios and combinations of different fungal species) change...

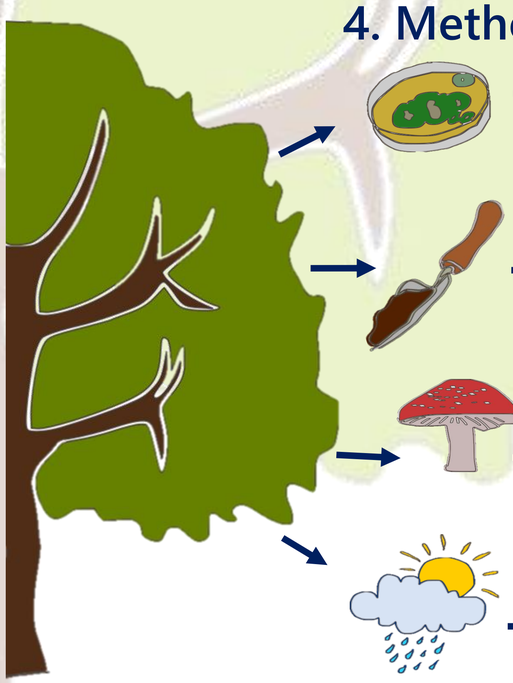
...Across the area of a woodland?

...Over the seasons & with changing weather?

...With time?

...With elevated CO_2?

4. Methods



Measuring and capturing airborne spores

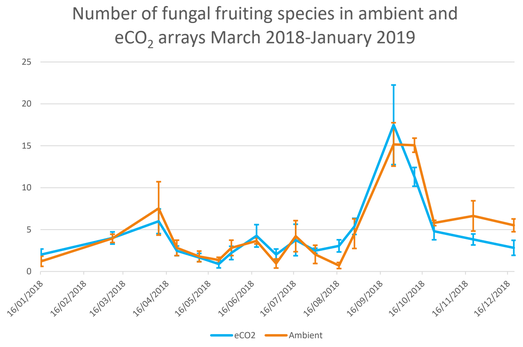
Extracting and analysing fungal DNA from soil

Surveying macro fungi

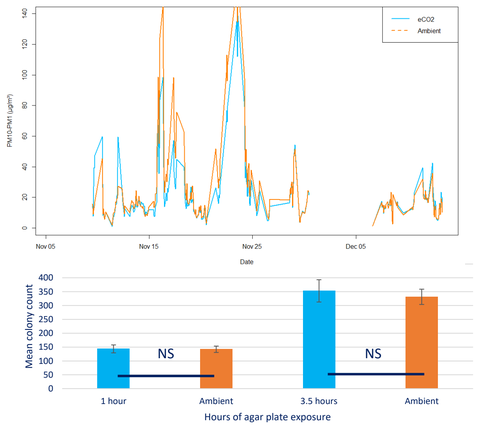
Measuring environmental data in depth

5. Results to date

Soil fungal communities are different between O and A soil layers



There was no change in the number of fungal species fruiting under eCO_2



There was no difference in measured or cultured bioaerosols under eCO_2

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